LIL' HERCULES

FLYING MODEL ROCKET

- Ideal Beginner Kit
- Easy-to-Assemble
- "Tumble" Recovery

#5001
(KA-1)

Centuri

RECOMMENDED ENGINES
Not included
½A6-2 ½A6-4

SPECIFICATIONS

Length	6.5"
Body Dia.	0.76"
Net Wt.	0.3 oz.

Made in U.S.A. Centuri, Phoenix, Arizona

TYPICAL ALTITUDES
Altitudes depend greatly on the quality of assembly and finishing.

Engine	Feet
½A	280

SKILL LEVEL

1	2	3	4	5
Beginner		Intermediate		Advanced

TOOLS YOU WILL NEED:

REQUIRED
White Glue

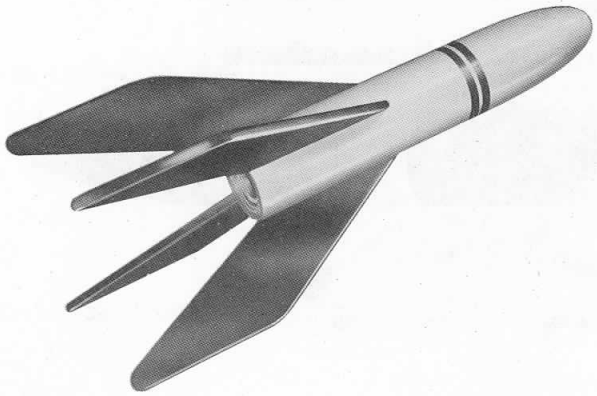
OPTIONAL
Small Brush
Balsa Filler
Fine Sandpaper
Spray Paint

Centuri

LIL' HERCULES

HERCULES II

Catalog No. KA-1

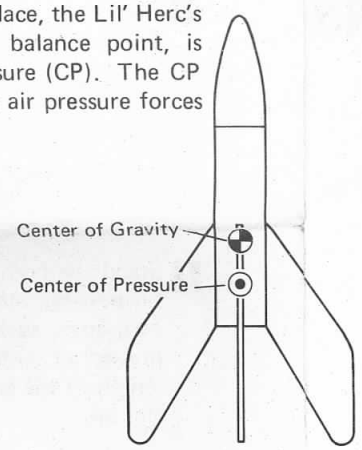


This rocket is designed to be launched only from standard remote-controlled electrical launch systems. Always use the recommended engines. Comply with all Federal, State, and local laws when launching rockets in your community.

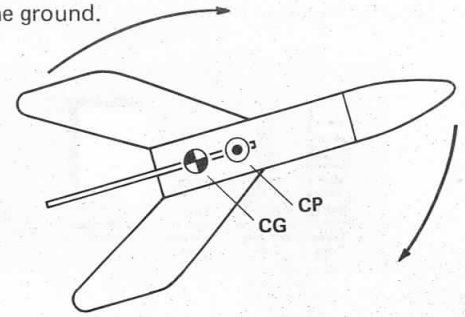
Up goes the Lil' Herc, climbing into the sky, straight as an arrow . . . POP! goes the engine's ejection charge — expelling the expended engine casing to tumble harmlessly to the ground . . . down comes the Lil' Herc II tumbling gently to Earth . . . ready to be prepped for another flight!

HOW DOES THE LIL' HERC FLY?

Why does the Lil' Herc fly up straight, but tumble safely back? Look at the Lil' Herc below. With the engine in place, the Lil' Herc's Center of Gravity (CG), or balance point, is ahead of the Center of Pressure (CP). The CP is the point at which all the air pressure forces seem to be concentrated. The engine's weight places the CG toward the front of the rocket, while the large fins move the CP toward the rear. With the Center of Gravity ahead of the Center of Pressure, the Lil' Herc (or any model rocket) will fly in a straight, stable flight path. The same concept is used in the design of archery arrows.



After the engine ejects in flight, the CG moves toward the rear because of the weights on the fin tips. Now the Lil' Herc tries to streamline in aerodynamically, but it can't because the weight on the fin tips makes it try to point tail-first. These two actions "fight" each other, causing the Lil' Herc to tumble as it falls. This tumbling creates aerodynamic "drag", allowing the Lil' Herc to fall slowly, and gently to the ground.



MODEL ROCKETEER'S SAFETY CODE

CONSTRUCTION
My model rockets will be made of only lightweight materials such as paper, wood, plastic, and thin metallic foils, with the exception of payloads and engine holders made of wirelike material.

ENGINES
I will use only pre-loaded factory made model rocket engines in the manner recommended by the manufacturer. I will not change in any way nor attempt to reload these engines.

RECOVERY
I will always use a recovery system in my model rocket that will return them safely to the ground so that they may be flown again.

WEIGHT LIMITS
My model rocket will weigh no more than 453 grams (16 oz.) at liftoff, and the engines will contain no more than 113 (4 oz.) of propellant, as prescribed by Federal Regulations.

STABILITY
I will check the stability of my model rockets before their first flight except when launching models of already proven stability.

LAUNCHING SYSTEM
The system I use to launch my rockets will be remotely controlled and electrically operated, and will contain a switch that will return to "off" when released. I will remain at least 10 feet away from any rocket that is being launched.

LAUNCH SAFETY
I will not let anyone approach a model rocket on a launcher until I have made sure that either the safety interlock key has been removed or the battery has been disconnected from my launcher.

LAUNCH AREA
My model rockets will always be launched from a cleared area, free of any easy-to-burn materials, and I will only use non-flammable recovery wadding in my rockets.

BLAST DEFLECTOR
My launcher will have a blast deflector device to prevent the engine exhaust from hitting the ground directly.

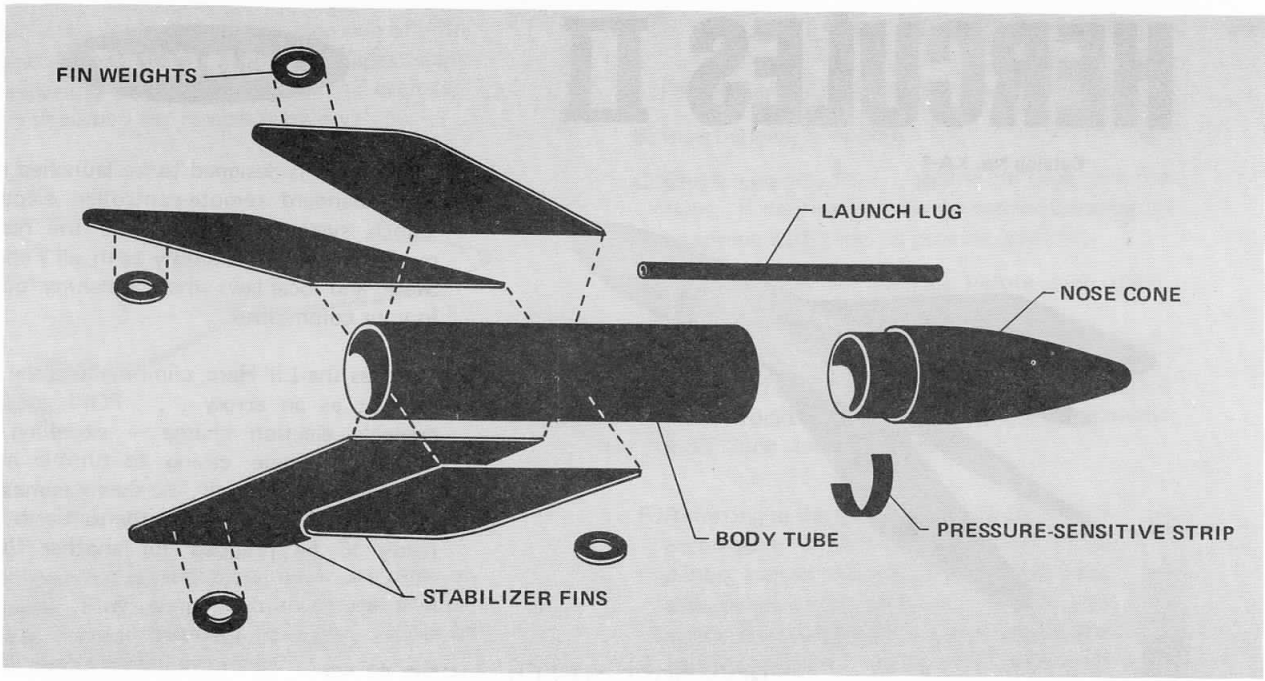
LAUNCH ROD
To prevent accidental eye injury I will always place the launcher so the end of the rod is above eye level or cap the end of the rod with my hand when approaching it. I will never place my head or body over the launching rod. When my launcher is not in use I will always store it so that the launch rod is not in an upright position.

POWER LINES
I will never attempt to recover my rocket from a power line or other dangerous places.

LAUNCH TARGETS AND ANGLE
I will not launch rockets so their flight path will carry them against targets on the ground, and will never use an explosive warhead nor a payload that is intended to be flammable. My launching device will always be pointed within 30 degrees of vertical.

PRE-LAUNCH TEST
When conducting research activities with unproven designs or methods, I will, when possible, determine their reliability through pre-launch tests. I will conduct launchings of unproven designs in complete isolation from persons not participating in the actual launching.

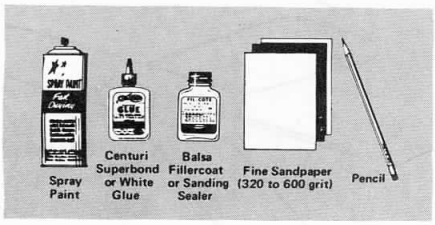
FLYING CONDITIONS
I will not launch my model rocket in high winds, near buildings, power lines, tall trees, low flying aircraft or under any conditions which might be dangerous to people or property.



ASSEMBLY INSTRUCTIONS

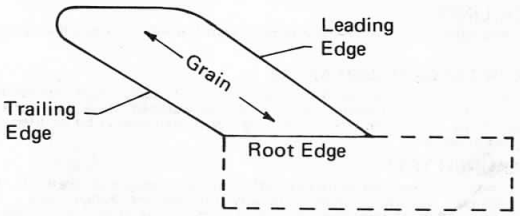
READ BEFORE STARTING ASSEMBLY

TOOLS: In addition to the parts supplied, you will need the following tools to assemble and finish this kit. DO NOT use model airplane glue for building flying model rockets.

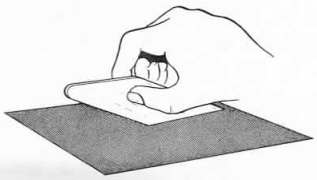


1 These assembly steps are presented in a logical order to help you put the Lil' Herc together quickly. Every step is important, to come up with a rocket that flies well.

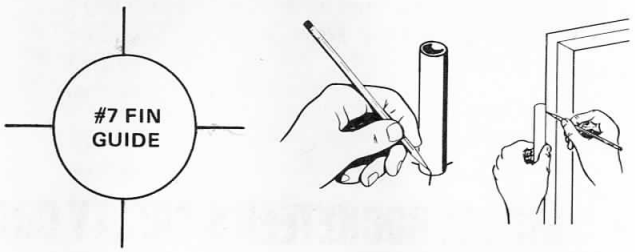
2 Carefully push the die-cut fins from their sheet. Start at one point on each fin and work gently around. The Lil' Herc fin shown below is labeled with the terms used to describe any typical rocket fin.



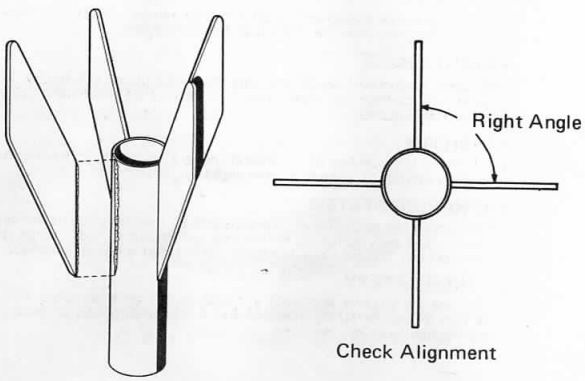
3 Square up the fin root edges by running fins over a piece of fine sandpaper.



4 Stand the body tube on its fin guide and make fin position marks. Find a convenient channel or groove, such as a door jamb, partially open drawer, or molding. Extend the marks the full length of the tube, to make neat lines for gluing fins on.



5 Apply glue to the root edge of a fin and position it along line drawn on the body tube. Remove, allow to dry, apply glue again, and re-position. Allow to dry standing vertically, and check alignment visually.



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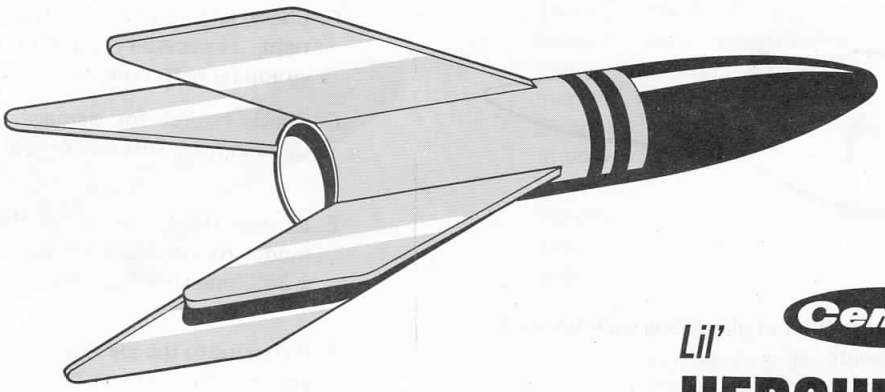
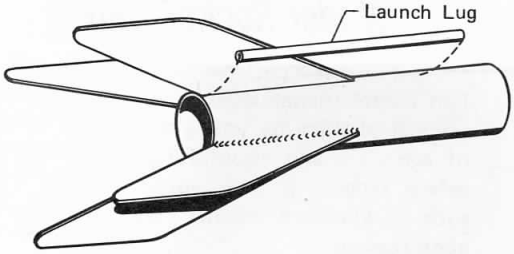
COMPLETED ASSEMBLY



Lil' Centuri

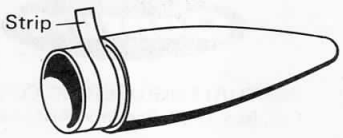
HERCULES II

6 After the fin assembly has completely dried, run a small bead of glue along both sides of each fin-body tube joint. Using the forefinger, smooth the glue into even fillets. Glue the launch lug onto the body, right against the base of one fin.

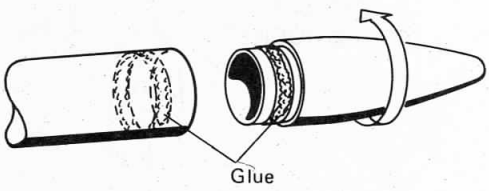


7 Allow the assembly to dry standing vertically. Check again to be sure glue does not run, and that fins are still neatly aligned. Allow to dry thoroughly before handling again.

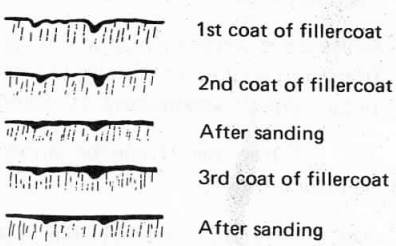
8 The plastic nose cone must be glued firmly in place to withstand the engine ejection charge in flight. Peel backing off small pressure-sensitive strip, and apply firmly to base of nose cone.



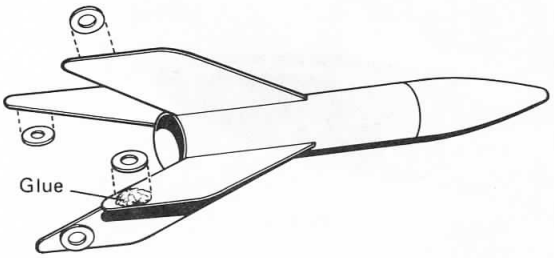
9 Smooth inside edge of body tube with fingernail to remove burrs, and test-fit the nose cone. Glue nose cone in place by smearing glue inside the body tube and on the nose cone base. Glue in place with firm, even, twisting motion. Wipe away excess glue.



10 When fillets have dried, prepare balsa surfaces for a smooth and realistic finish. Fill the wood grain with Centuri fillercoat or sanding sealer. When dry, sand with fine sandpaper. Repeat until smooth.



11 Spread a few drops of glue on one side of a fin tip, and apply a weight (washer). Repeat steps on remaining fins . . . one weight to each fin. This is necessary for tumble recovery!

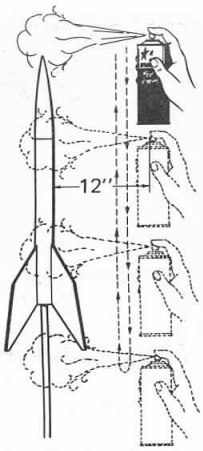


12 Apply one more fillet of glue along each fin root for extra strength.

13 When painting plastic parts, never use dope or lacquers! First, spray with an enamel primer. Choose a color that will be highly visible in flight, such as black or orange.

14 Spray painting your finished model with a fast-drying enamel will produce the best results . . . IF IT IS DONE PROPERLY!!! Most important is the number of coats of paint. DO NOT try to paint your model with one heavy coat! Instead, give it a couple of quick, light coats first and then a finish coat. Let each coat dry before applying the next.

SPRAYING A TYPICAL MODEL ROCKET



ENGINES

NOTE: Be sure all glue joints are dry before launching the Lil' Herc, or the engine may glue itself in place!

Igniters and complete engine installation instructions are included in "Engine Operating Instructions" which accompany all Centuri engines.

The Lil' Hercules II can be launched with the following engines:

½A6-2 MEDIUM ALTITUDE – for first test flights and small launch areas.

½A6-4 HIGH ALTITUDE – for general flying and larger launch areas.

FLIGHT PREPPING

A. Prepare igniter and position it in engine.

B. Insert engine in rocket.

C. Check engine's fit . . . should be snug, but not tight. If necessary, build up engine diameter by wrapping with tape, to provide good fit.

D. Check rocket for damage before each flight. Launch from soft dirt or grassy areas.

E. Launch the Lil' Hercules II from any standard model rocket launcher having a 1/8" diameter x 36" long steel launch rod.

F. Referring to the specific instructions which accompany Centuri launchers and firing panels, mount the rocket on the launcher and prepare for ignition. Avoid eye injury by capping the exposed tip of the launch rod when not actually launching! Follow the instructions and the Safety Code, and have many happy hours with Model Rocketry.

Model Rocket Safety

Throughout the past twelve years, over 25 million model rocket launchings have been made – most of them by young men 10 to 17 years of age . . . and establishing one of the best safety records of any youth activity. Why such an excellent record? Well, here are four good reasons:

FIRST, the rocket engines are self-contained in non-metallic casings – no mixing of chemicals. Engine reliability and performance are tested continually at the factory.

SECOND, the rocket itself is constructed of strong, but extremely lightweight materials such as balsa, paper, and plastic. And, the rockets contain recovery systems which bring them slowly and safely back down to Earth.

THIRD, the engines are ignited electrically using special igniters and safety firing switches. No matches or fuses are used.

FOURTH, and most important, is the attitude of the model rocketeers. They look upon this hobby as being exciting and educational. They don't think of rockets as toys. Hundreds of thousands of rocketeers have promoted the safety of the hobby by following the Safety Code. Follow it and enjoy this exciting hobby of Model Rocketry.

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